

May 2009

# Justification of the Skyline Innovation Center at Worcester Technical High School

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## Repository Citation

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# **Justification of the Skyline Innovation Center at Worcester Technical High School**

An Interactive Qualifying Project Report:

submitted to the faculty of the

WORCESTER POLYTECHNIC INSTITUTE

in partial fulfillment of the requirements for the

Degree of Bachelor of Science

By

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Daniel Flavin

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Dimitri Baklla

Date: April 30, 2009

Approved:

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Professor Richard Sisson, Advisor

## **Abstract**

This project, completed in conjunction with the Worcester Technical High School (WTHS) and the proposed Skyline Innovation Center at WTHS., was conducted to determine the commercial and entrepreneurial interest in developing and using an Innovation Center at WTHS. A series of interviews were conducted with Professors from the Worcester Polytechnic Institute (WPI) and local business owners and entrepreneurs. The results showed an overwhelming support for the Skyline Innovation Center in Worcester. This Innovation Center would be a great benefit to many local companies and entrepreneurs to assist in the design and fabrication of prototypes and test parts. These efforts would lead to the development of new products and services and new businesses in central Massachusetts.

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# **1 Introduction and Background**

The Worcester Technical High School (WTHS), opened in 2006, is an advancement on the traditional model of a technical high school. WTHS was designed and built to serve as a resource to the academic and business communities in Central Massachusetts, and as a regional economic engine. The academic program of the school is set up to educate and prepare students both academically and technically. Since its inception, WTHS has been backed by the Skyline Technical Fund, a not-for-profit foundation dedicated to the support and advancement of the WTHS.<sup>1</sup>

Worcester Technical High School is currently organized into four academies, with twenty four specific disciplines, shown in Table 1, intended to educate students in state of the art technologies and skills needed to succeed in the modern workplace. WTHS serves 1,500 high-school students during the school day, and has the potential to accommodate a similar number of after-hours adult learners.<sup>1</sup>

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<sup>1</sup> “SKYLINE INNOVATION CENTER Grant Application Package”, Construction Grant Package 2008-NIST-01, 21 July 2008

**Table 1: Current Academies and Disciplines of the Worcester Technical High School<sup>1</sup>**

<b>Business:</b> Cisco/Dell Information Technology and Business Services Academy	<b>Manufacturing:</b> Alden Design and Engineering Academy	<b>Construction:</b> Construction Technologies Academy	<b>Health:</b> Allied Health and Human Services Academy
Graphic Communications	Automotive Technician	Carpentry	Health Assistant, Medical/Lab Assistant, Nursing Assistant
Office Technology Software & Portal Development	Auto Collision Technology	Electrical	Environmental Technology
Cisco Academy Telecommunications, Computer Technology Repair / Network Services	Pre-Engineering, Drafting / AutoCAD	HVAC/R Heating, Ventilation, Air Condition & Refrigeration	Cosmetology & Personal Services
Culinary Arts, Baking and Pastry	Robotics / Machine Tool Technology CAM	Sheet Metal Technology	Horticulture, Green House Management, Landscaping & Turf Management
Travel & Tourism, Hotel, Restaurant & Tourism Management	Electro Mechanical Technology Electronics PLC	Plumbing & Pipefitting	Early Childhood Education & Care
Finance & Marketing	Welding & Metals Technology	Interior Design & Decoration / Painting	Veterinary Tech Assistant

In order to enhance the ability of WTHS to assist the central New England technical community, the Skyline Technical Fund has developed a proposal for the Skyline Innovation Center (SIC) on the WTHS campus to the National Institute of Standards and Technology (NIST). The SIC would add a fifth academy, with the five disciplines shown in Table 2 to WTHS. The aim of the SIC would be the study and application of emerging technologies, while fostering cooperation between WTHS, institutions of higher education such as WPI, and the many businesses and industries in surrounding areas.

The Skyline Innovation Center would also establish a researcher in residence program. As the NIST grant proposal explains, *“Like the ‘artist in residence’ programs at cultural and educational institutions, the Innovation Center will extend an invitation to the scientific community to*

**Table 2: Proposed Addition to WTHS Curriculum**

<b>Innovation:</b> New and Emerging Technologies Research Academy
Life Sciences / Biotechnology
Renewable / Alternative Energy: Photovoltaics, Wind Power, Fuel Cell Technologies
Conservation / Recycling Technologies
Aerospace
Information Technology Research

*use the WTHS laboratories and facilities while the participants commit themselves to a research program to benefit the school's students. These "researchers in residence" will be given a forum to present and discuss their work, inspiring students and faculty. They will also be offered the other resources of Worcester Technical High School, including the manufacturing capabilities, the student manpower, and IT infrastructure and support."*<sup>1</sup>

The SIC was proposed to offer many opportunities to the scientific and manufacturing community of central Massachusetts, when properly utilized. In order to ensure such use, the Skyline Technical Fund approached WPI to assist in gauging academic and commercial interest in the proposed Skyline Innovation Center.

Therefore, it is the goal of this project to develop and implement a process to accurately determine the level of interest and the potential users of the proposed Skyline Innovation Center. This process will include the identification of potential users from the industries and universities of central Massachusetts. The potential users will be interviewed to determine if they would use the services and facilities offered by the SIC. In addition, the survey will determine if they would be willing to work with the staff and students at the SIC with their innovative projects.

## **2 Methodology**

In order to determine potential participation in the proposed Skyline Innovation Center, a series of meetings and interviews were planned with both academic and business groups. These meetings had several goals. The first was to establish possible advantages of involvement with the SIC. The second goal was to identify specific cooperative projects and skill set requirements. The final goal of each meeting was to collect contact information for other groups or individuals for further interviews.

### **2.1 Identification of Potential Skyline Innovation Center Users**

Before any meetings could be held, potential users of the SIC had to be identified. The ideal user would be experienced in the technical industries included in the SIC proposal, and willing to collaborate with students and staff. Possible patrons could include research groups at universities, entrepreneurs working in venture incubators, or established companies looking for an edge in the marketplace. Each potential user was contacted by telephone or electronic mail. Those in the immediate Worcester area received a request to meet in person, while those outside of the city were asked for telephone interviews. In many cases, several attempts were necessary to before a response was received. The list of interviewees is presented in Table 3.



**Table 3: Potential SIC Users**

<b>Name:</b>	<b>Position</b>
Richard D. Sisson, Jr.	Director, Materials Science, WPI
Diran Apelian	Director, Material Processing Institute, WPI
Diana Lados	Professor, Mechanical Engineering, WPI
Pins, George D.	Professor, Life Sciences and Bioengineering, WPI
Jim Van de Ven	Professor, Mechanical Engineering, WPI
Jack Healy	Director of Operations, MassMEP
Tanja Dominko	President & CSO, CellThera, Inc.
Raymond L. Page	Director of Research, CellThera, Inc.
Harry Wotton	President, Securos, Inc.
McRae C Banks	Director, Collaborative for Entrepreneurship and Innovation, WPI
Chickery J. Kasouf	Professor, Management Dept, WPI
Neil T. Heffernan	Professor, Computer Science Dept, WPI
Adam Cohen	VP of Engineering, Polar Controls, Inc
Gretar Tryggvason	Department Head, Mechanical Engineering, WPI
Christopher A. Brown	Director, Haas Technical Education Center, WPI
Nikolaos A. Gatsonis	Director, Aerospace Engineering Program, WPI
Kristen L. Billiar	Professor, Biomedical Engineering, WPI
Yi Hua Ma	Director, Center for Inorganic Membrane Studies, WPI
Kevin Rong	Professor, Mechanical Engineering, WPI

## 2.2 Interview Format and Questions

Prior to each meeting, the participants were given a complete description of Worcester Technical High School and the Skyline Innovation Center design, as shown in Appendix A. The information presented the full scope of the WTHS and allowed participants to align the abilities of the school with potential projects.

At each meeting, two members of the WPI student team were present. This allowed one student to lead discussion while the second recorded responses. To start each meeting, the SIC introduction was summarized, and questions answered regarding its purpose. Meeting participants used their research and development goals to determine potential areas of collaboration. Specific projects were identified which would benefit from the expertise of the WTHS students while advancing their education. Equipment and skill requirements for these projects were noted. The meeting participants were then given time to offer

opinions or suggestions regarding the SIC. Before the meeting closed, each participant was asked to think of other potential contributors to the Center. A blank copy of the interview note sheet may be found in Appendix B: Blank Interview Outline.

The specific questions asked during the meeting were very basic. The first question was simply to gauge interest level: Was the individual likely to participate in the Skyline Innovation Center? Why or why not? This question would initiate a conversation regarding the potential advantages or disadvantages of the SIC.

Presuming a positive response to the first question, the second question investigated projects that might benefit from the SIC, either immediately or in the near future. Specific examples were recorded where appropriate.

Once specific projects were brought to light, their equipment and skill requirements were noted. This data was requested by the Skyline Technical Fund as part of the project, so that the capabilities of the SIC could be matched to the needs of the user base.

At this stage possible benefits of the Researcher in Residence position were discussed. This question was not listed on the interview sheet, as it was asked only of those individuals who expressed a strong interest in the SIC.

The floor was then opened to opinions and suggestions regarding the SIC. This gave the meeting participants an opportunity to voice any general comments or concerns the addressed by the previous questions.

Finally, contact information for other potential SIC users was requested. Collecting contact information allowed the gradual expansion of the interview field. While many of the interview participants were local to the Worcester area, the Innovation Center has the potential to attract interest from throughout not only Massachusetts but the entire New England area.

## **2.3 Tabulation and Analysis of Results**

The data was compiled into two tables, one for academic and one for industry. Due to the open nature of many of the questions, and the varied backgrounds of meeting participants, it was difficult to apply standard statistical methods to the collected data. However, it was possible to sort the data by applying Boolean principles to the results of the first two interview questions, regarding interest and project use.

### 3 Results

The results of the interviews may be seen in Table 4 and Table 5. A total of fourteen academic researchers were interviewed, with several others declining. Five representatives of industrial companies were interviewed, while many others declined to be interviewed or did not respond at all to repeated contact attempts.

**Table 4: Academic Interview Results**

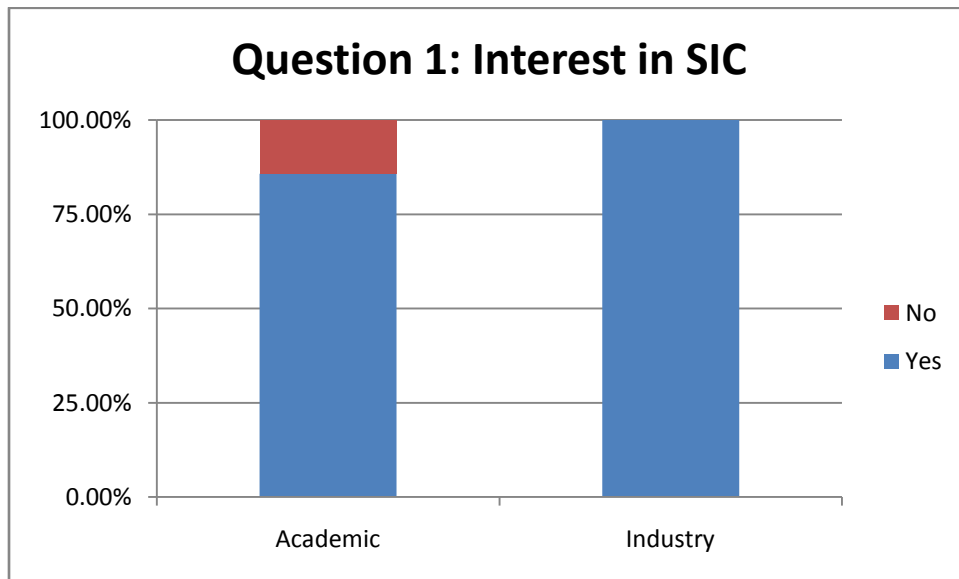
<b>Name:</b>	<b>Position</b>	<b>Interest?</b>	<b>Proj?</b>	<b>Specific:</b>	<b>Equipment/Skills Needed:</b>
Apelian, Diran	Director, Material Processing Institute, WPI	Y	N		
Banks, McRae	Director, Collaborative for Entrepreneurship and Innovation, WPI	Y	Y	Work with WPI Venture Forum	
Billiar, Kristen	Professor, Biomedical Engineering, WPI	Y	N	Prosthetics, Mechanobiology	Machining and Bio Engineering Labs, Rapid Prototyping
Brown, Christopher	Director, Haas Technical Education Center, WPI	N	N		
Gatsonis, Nikolaos	Director, Aerospace Engineering Program, WPI	Y	N	MQP projects, building parts	
Heffernan, Neil	Professor, Computer Science Dept, WPI	Y	Y	Tutoring methods	
Kasouf, Chickery J.	Professor, Management Dept, WPI	Y	N	Work with WPI Venture Forum, entrepreneurial incubator	
Lados, Diana	Professor, Mechanical Engineering, WPI	Y	Y	Metal Acoustics MQP	Machine shop
Ma, Yi Hua	Director, Center for Inorganic Membrane Studies, WPI	N	N	Very complex experiments require advanced labs	
Pins, George	Professor, Life Sciences and Bioengineering, WPI	Y	N	Possible seminars, RiR interest	Open lab spaces, Injection molding
Rong, Kevin	Professor, Mechanical Engineering, WPI	Y	N		
Sisson, Richard	Director, Materials Science, WPI	Y	Y		
Tryggvason, Gretar	Department Head, Mechanical Engineering, WPI	Y	N	MQP collaboration, research prototypes	Machine shop and people to use it
Van de Ven, Jim	Professor, Mechanical Engineering, WPI	Y	Y	Liquid Piston Sterling engine, Hybrid Vehicles RiR interest	Wind tunnel, Regenerative dynamometer

**Table 5: Industry Interview Results**

<b>Name:</b>	<b>Position</b>	<b>Interest?</b>	<b>Proj?</b>	<b>Specific:</b>	<b>Equipment/Skills Needed:</b>
Bordonaro, Chris M.	Evergreen Solar	N/A	N/A	Passed proposal on to management	
Cohen, Adam	VP of Engineering, Polar Controls, Inc	Y	Y	Environmental Control Rooms	PCB Fabrication
Dominko, Tanja	President & CSO, CellThera, Inc.	Y	N		
Healy, Jack	Director of Operations, MassMEP	Y	Y		Wind turbine technicians
Page, Raymond	Director of Research, CellThera, Inc.	Y	N		Plastic injection molding, glass work
Wotton, Harry	President, Securos, Inc.	Y	Y	Orthopedic Devices	CAD, 3D modeling, Rapid Prototyping.

### 3.1 Question 1 Responses

The first question asked at each meeting was “Do you see yourself participating in the Skyline Innovation Center?” The results are presented in Figure 1.



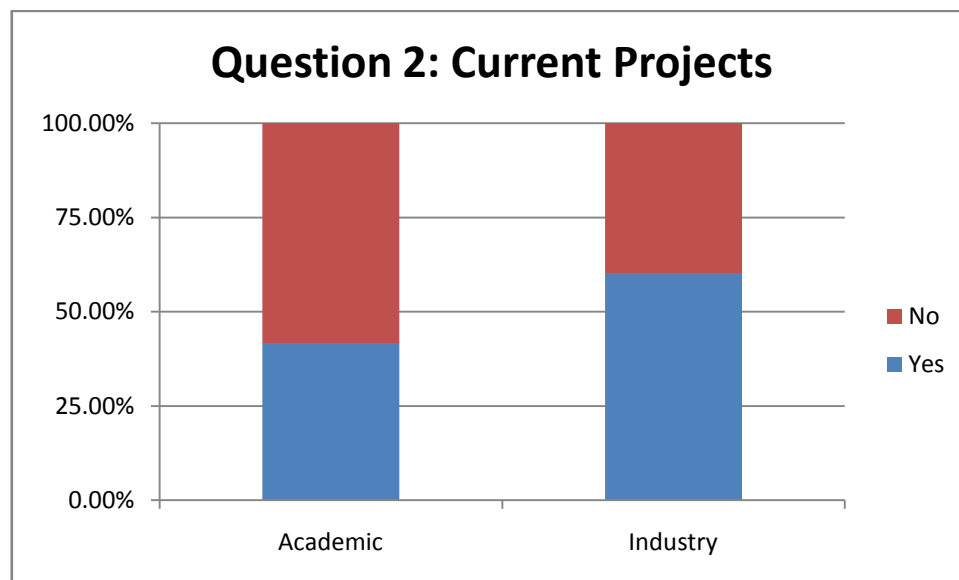
**Figure 1: Participation Interest in the proposed Skyline Innovation Center**

As can be seen, a great majority of respondents felt that the SIC would be useful to their research or company. The few academic researchers who declined interest felt that their needs were met with the

resources at their disposal, or felt that their experimental requirements were too complex for the SIC. Every member of industry, however, felt that collaboration in the SIC would be advantageous to their company.

### 3.2 Question 2 Responses

The second question asked during meetings was “Do you have specific projects at the current time which would benefit from the Skyline Innovation Center?” The responses to this question may be seen below in Figure 2.



**Figure 2: Current or Future Projects for SIC Collaboration**

As can be seen, slightly less than half of academic researchers and slightly more than half of industry representatives had projects at hand which would benefit from the SIC. Many of those without immediate projects, particularly in industry, showed regret that the SIC had been unavailable during a past project.

## **4 Discussion**

The response to the proposed SIC was positive, though different groups saw several advantages to participating in the SIC . The responses have been broken into two section, academic and industry.

### **4.1 Academic**

The academic interviews were conducted throughout the WPI campus. While a few professors declined to meet, all others saw great potential in the proposed Innovation Center.

Many felt that the Innovation Center would be an excellent tool for bringing WPI and WTHS into closer collaboration. Dr. Tryggvason, head of the Mechanical Engineering, saw the Innovation Center as an important resource for Major Qualify Project (MQP) work, allowing WPI students to collaborate with WTHS students in the design and manufacture of test parts and prototypes. Professor Lados, also in Mechanical Engineering Department, held similar views, stating that new projects every year would benefit from the type of cooperation the Innovation Center would support.

Others members of the WPI community felt that the Innovation Center would be an excellent opportunity to assist local business interests. Dr. Apelian, Director of the Materials Processing Institute, was one such enthusiast. He felt that bringing WPI professors to the Innovation Center to lead discussions on upcoming technologies would benefit both students and local corporations. Similarly, Professor Pins of the Life Sciences and Biotechnology volunteered his services in offering seminars to CEOs and managers of biotechnology companies, so that they might better understand the scientific foundations of their own companies.

Several professors had specific projects in progress which they felt could be advanced Innovation Center. Professor Heffernan, of the Computer Science Department, believed that the online tutoring system under development at WPI would both benefit from, and be a benefit to, the WTHS students, by

allowing them to develop tutoring material for online use. Professor Van de Ven, advisor to the Mechanical Energy and Power Systems Laboratory, mentioned several advancing hybrid automotive power trains reaching the limits of bench-top experiments, ready to be installed in full-size testing vehicles – a prime opportunity for the Innovation Center to bring alternative energy to the high school’s automotive technology students.

Professor Sisson also stated that this proposed Innovation Center would be valuable for the fabrication of prototypes for testing and evaluation. He was sure that working with the SIC staff would improve the design of these potential products.

## **4.2 Industry**

While the academic community focused on the educational aspects of the Innovation Center, members of the commercial sector concentrated on the business potential. Each executive interviewed saw outstanding opportunities offered by the Innovation Center.

Mr. Healy, Operations Director at the Massachusetts’s Manufacturing Extension Partnership (MassMEP), looked at the economic perspective. Pointing to Governor Patrick’s push to have 2000 megawatts of wind energy by 2020, Mr. Healy emphasized the importance of having trained technicians to handle the increasing in complex infrastructure required for wind energy, and the importance of establishing an attractive environment for manufacturers within the state.

Small business entrepreneurs focused on the feedback opportunities presented by the Innovation Center. Adam Cohen, Vice President of Engineering at Polar Controls, Inc, found the potential for criticism and advice from the students on joint undertakings to be particularly appealing. Harry Wotton, President of Securos, Inc, felt the major advantage would be having machinists with an excellent scientific education. Both gentlemen were strongly interested in the Innovation Center as a potential



source for future employees, allowing businesses to develop relationships with students who could later become employees.

### 4.3 Quotations

❖ Dr. Diran Apelian, Director, Material Processing Institute, WPI

- “This is a very good opportunity for Worcester; this Innovation Center could open up all kinds of new opportunities.”

❖ Diana Lados, Professor, Material Sciences

- “This could really work and be very useful to WPI and Worcester, it will definitely be utilized.”

❖ Gretar Tryggvason, Head of Mechanical Engineering Department

- “I can see the Innovation Center utilized by most faculty in the Mechanical Engineering Department.”

❖ Prof. Jim Van de Ven, Mechanical Engineering Department

- “This facility would be great for scaling up lab prototypes sitting on a bench to full-size vehicles.”

❖ George D. Pins, Biomedical engineering

- “This facility would allow us to bring in managers and supervisors, give them a crash course in biological engineering, and then send them back with a better ability to interface with those working for them. “

❖ Mr. Jack Healey,

- “The governor’s plan to introduce 2000 megawatts [of wind energy] by 2020 means that we will need technicians to maintain these complicated systems. By introducing the students to these systems early, we will be able to supply a ready workforce to encourage the building of these turbines in Massachusetts.”

❖ Raymond Page, Director of Research, CellThera, Inc.

- “There are other centers with similar goals, but none with this kind of skill set available.”

❖ Harry Wotton, President of Securos

- “Small businesses have a hard time finding resources like the Innovation Center, every small business would be attracted to this center.”
- “The ability to go and watch the students work means that [a small business owner] can practically pick their employees.”
- “We could come up with new uses for this center every day.”

❖ Adam Cohen, VP Engineering for Polar Controls, Inc.

- “This center could definitely be used for mechanical projects.”
- “One of the advantages I see is the ability to work with, and get feedback from, the students as they set up to make the parts rather than just sending a drawing out and just getting the part.”
- “Working with students on projects is an opportunity that would be an advantage for many companies, for reasons like the feedback from a part is not just machined but reviewed.”

## **5 Conclusion**

Based on the results of our interviews, it has been determined that the Skyline Innovation Center would be a valuable asset to the New England economy. One hundred percent of business and commercial groups, and about sixty five percent of overall respondents, indicated that there was at least one project or program which could immediately benefit from the proposed Innovation Center. These projects ranged from alternative automotive technologies to medical equipment development to cutting edge cellular regenerative research. Even those respondents who had no immediate use for the Innovation Center felt that it would give Central Massachusetts an educational and economic advantage.

Though the Innovation Center is still in the formative phases, the list of prospective projects allows an insight into its potential future. Knowing the active research and business goals of the community, the center can be tailored to the expectations of the interested parties. It also allows the students of WTHS to be trained in the relevant fields, leaving them with marketable skills at graduation.

It is clear that the Innovation Center proposed at Worcester Technical High School would find a ready pool of interested participants, from both educational and commercial fields.

## 6 Appendices:

### 6.1 Appendix A: Innovation Center Description:

The Worcester Technical High School (WTHS) is housed in a newly constructed complex with new and state of the art equipment and facilities. The chart below provides a list of the disciplines offered in the school.

#### Worcester Technical High School 5 Academies – 29 Disciplines

<b>Business</b> Cisco / Dell Information Technology & Business Services Academy	<b>Manufacturing</b> Alden Design & Engineering Academy	<b>Construction</b> Construction Technologies Academy	<b>Health</b> Allied Health & Human Services Academy	<b>Innovation*</b> New & Emerging Technologies Research Academy
<i>Graphic Communications</i>	<i>Automotive Technician</i>	<i>Carpentry</i>	<i>Health Assistant, Medical / Lab Assistant Nursing Assistant</i>	<i>Life Sciences / Biotechnology</i>
<i>Office Technology Software &amp; Portal Development</i>	<i>Auto Collision Technology</i>	<i>Electrical</i>	<i>Environmental Technology</i>	<i>Renewable / Alternative Energy: (Photovoltaics, Wind Power, Fuel cell technologies)</i>
<i>Cisco Academy Telecommunications / Computer Technology Repair / network services</i>	<i>Pre-engineering Drafting / Auto CAD</i>	<i>HVAC/R Heating, Ventilation, Air Conditioning &amp; Refrigeration</i>	<i>Cosmetology &amp; Personal Services</i>	<i>Conservation / Recycling Technologies</i>
<i>Culinary Arts, Baking &amp; Pastry</i>	<i>Robotics / Machine Tool Technology CAM</i>	<i>Sheet Metal Technology</i>	<i>Horticulture, Green House Management, Landscaping &amp; Turf Management</i>	<i>Aerospace</i>
<i>Travel &amp; Tourism Hotel, Restaurant &amp; Tourism Management</i>	<i>Electro / Mechanical Technology Electronics PLC</i>	<i>Plumbing &amp; Pipefitting</i>	<i>Early Childhood Education &amp; Care</i>	<i>Information Technology Research</i>
<i>Finance &amp; Marketing</i>	<i>Welding &amp; Metals Technology</i>	<i>Interior Design &amp; Decorating / Painting</i>	<i>Veterinary Tech Assistant</i>	

\* The Innovation Academy for New and Emerging Technologies is proposed, as are the new disciplines contained within it. The Biotechnology program would be expanded, and move from the health academy. IT would expand, adding the research component.

As a technical high school there is equal emphasis on academics and hands on training that is not easily found in other high schools. The WTHS administration is interested in putting the abilities of the students to use while engaging their interest upcoming technologies.

The WTHS has plans for an Innovation Center, a place for the development and commercialization of new products and the latest advances in research. The goal of this new center will be to work with local business incubators, academic researchers and independent entrepreneurs to supply access to work force, facilities and resources.

## **6.2 Appendix B: Blank Interview Outline**

### Worcester Technical High School Innovation Center IQP Interview

Name:

Position:

Organization:

Field:

Interested in using center? YES / NO

Immediate Projects? YES / NO

Examples:

Required Equipment:

Other Suggestions:

Other Potential Contacts:

### **6.3 Appendix C: Interview Notes**

Worcester Technical High School Innovation Center IQP Interview

Name: Gretar Tryggvason

Position: Department Head

Organization: WPI

Field: Mechanical Engineering

Interested in using center? ☒ YES / NO

Immediate Projects? YES / ☒ NO

Examples:

Many parts of the Mechanical Engineering department would use the center, Robotics, Manufacturing, Design.

Personal project don't apply since they are computer simulations.

Required Equipment:

N/A

Other Suggestions:

This would be a very useful Center for the Mechanical Engineering Department.

It is a very good opportunity for WPI students to cooperate with WTHS students.

Other Potential Contacts:

James Van de Ven, Ken Stanford, Allen Hoffman, Diran Apelian.



Worcester Technical High School Innovation Center IQP Interview

Name: Harry Wotton

Position: President of Company

Organization: Securos, Inc.

Field: Manufactures veterinary orthopedics

Interested in using center? ☒ YES / NO

Immediate Projects? ☒ YES / NO

Examples:

New projects all the time also new parts need to be built relating to orthopedics.

Required Equipment:

Rapid Prototyping, Cad & 3D Modeling, Coordinate Measuring Machine

Other Suggestions:

Many businesses would be attracted to a center like this is and they would diffidently utilize it.

Other Potential Contacts:

Jay Ray, Doug Hefell, Steve Ostrino, Steve Taritmi, Steve Knowlan. All business owners that would be interested in this center.

Worcester Technical High School Innovation Center IQP Interview

Name: Jack Healey

Position: Director of Operations of MassMEP

Organization: MassMEP

Field: Manufacturing

Interested in using center? YES / NO

Immediate Projects? YES / NO

Examples/ Projects:

Training students in new green technologies, material testing for wind turbines and solar panels.

Required Equipment:

N/A

Other Suggestions:

No personal use possible. But would/will support a center like this.

This new center would benefit Worcester, WPI and the businesses in the area.

Help Worcester to progress from an old to a new economy, green energy. Provide a base for this new industry, that would be a great asset.

Massachusetts Technology Collaborative also has a renewable energy trust that works with many different groups

Other Potential Contacts:

Diamond Antenna & Microwave, Jeffrey Gilling.

Worcester Technical High School Innovation Center IQP Interview

Name: James Van de Ven

Position: Professor

Organization: WPI

Field: Mechanical Engineering

Interested in using center? ☒ YES / NO

Immediate Projects? ☒ YES / NO

Examples:

Liquid piston Sterling Engine

Hybrid Vehicle with on a flywheel

Required Equipment:

Regenerative Dynamometer, Wind Turbine, Machine Shop.

Other Suggestions:

Other Potential Contacts:

David Olinger

Worcester Technical High School Innovation Center IQP Interview

Name: Kristen Billiar

Position: Professor

Organization: WPI

Field: Life Sciences and Bioengineering

Interested in using center immediately? ☒ YES / NO

Immediate Projects? YES / ☒ NO

Examples:

Mechatronics, Prosthetics

Required Equipment:

Rapid Prototyping, Machining, Bioengineering

Other Suggestions:

This center would be very useful and has a great potential to be used by the Life Sciences and Bioengineering Center.

Other Potential Contacts:

George Pins

Worcester Technical High School Innovation Center IQP Interview

Name: McRae Banks

Position: Head, Department of Management

Organization: WPI

Field: Entrepreneurship and Strategy

Interested in using center immediately? ☒ YES / NO

Immediate Projects? YES / ☒ NO

Examples:

Connect with WPI Venture Forum (business incubator, needs access to prototyping and manufacturing advice)

Required Equipment:

Other Suggestions:

Other Potential Contacts:

Worcester Technical High School Innovation Center IQP Interview

Name: Neil Heffernan

Position: Professor

Organization: WPI

Field: Computer Science

Interested in using center? ☒ YES / NO

Immediate Projects? ☒ YES / NO

Examples:

Online tutoring systems

Required Equipment:

N/A

Other Suggestions:

Other Potential Contacts:

James Van de Ven, Diran Apelian.

Worcester Technical High School Innovation Center IQP Interview

Name: Nikolaos Gatsonis

Position: Director of Aerospace Engineering

Organization: WPI

Field: Mechanical, Aerospace Engineering

Interested in using center? ☒ YES / NO

Immediate Projects? ☒ YES / NO

Examples:

Required Equipment:

Building parts and using it for MQP projects.

Other Suggestions:

This could be a very useful Center for the Mechanical Engineering Department.

But how much innovation can be offered from a High School.

Other Potential Contacts:

David Olinger, James Van De Ven

Worcester Technical High School Innovation Center IQP Interview

Name: Raymond Page

Position: Director of Research

Organization: WPI and CellThera, Inc.

Field: Mechanical, Aerospace Engineering

Interested in using center? ☒ YES / NO

Immediate Projects? YES / ☒ NO

Examples:

Injection Molding and other equipment for lab use.

Required Equipment:

Other Suggestions:

UMASS has a similar Center for only biomedical research and training.

Other Potential Contacts:



Worcester Technical High School Innovation Center IQP Interview

Name: Tanja Dominko

Position: President & CSO CellThera, Inc.

Organization: WPI and CellThera, Inc.

Field: Life Sciences and Bioengineering

Interested in using center? ☒ YES / NO

Immediate Projects? YES / ☒ NO

Examples:

Required Equipment:

Other Suggestions:

SEE NOTES FOR PAGE, RAYMOND

Other Potential Contacts:

Worcester Technical High School Innovation Center IQP Interview

Name: Yi Hua Ma

Position: Professor

Organization: WPI

Field: Chemical Engineering

Interested in using center? YES / ☒ NO

Immediate Projects? YES / ☒ NO

Examples:

Projects in Chemical Engineering are very specialized and require very specific equipment.

Required Equipment:

Other Suggestions:

This center is a very good idea but I don't see any potential involvement with the chemical engineering department.

Other Potential Contacts:

Worcester Technical High School Innovation Center IQP Interview

Name: Yiming (Kevin) Rong

Position: Professor

Organization: WPI

Field: Mechanical, Manufacturing, Robotics Engineering

Interested in using center? ☒ YES / NO

Immediate Projects? YES / ☒ NO

Examples:

MQP projects would be a good idea for WPI and WTHS students to work together.

Required Equipment:

Other Suggestions:

Other Potential Contacts:

Adam Cohen, Allen Hoffman, Diran Apelian

Worcester Technical High School Innovation Center IQP Interview

Name: Adam Cohen

Position: VP of Engineering

Organization: Polar Controls, Inc

Field: Embedded Controllers and Monitor Circuits

Interested in using center? ☒ YES / NO

Immediate Projects? ☒ YES / NO

Examples:

Building Printed Circuit Boards (PCBs), and other mechanical parts needed in the company.

Required Equipment:

Other Suggestions:

It is a great idea; this center will definitely be used by many companies and small businesses.

The idea of working with students in setup and building a part is very good and useful.

Other Potential Contacts:

Worcester Technical High School Innovation Center IQP Interview

Name: Chickery Kasouf

Position: Professor

Organization: WPI

Field: Management Department

Interested in using center? ☒ YES / NO

Immediate Projects? YES / ☒ NO

Examples:

Required Equipment:

SEE BANKS NOTES

Other Suggestions:

Other Potential Contacts:

Worcester Technical High School Innovation Center IQP Interview

Name: Christopher Brown

Position: Professor

Organization: WPI

Field: Mechanical Engineering

Interested in using center? YES / ☒ NO

Immediate Projects? YES / ☒ NO

Examples:

Required Equipment:

Other Suggestions:

Would prefer to see a similar idea in WPI rather than in another school.

Other Potential Contacts:

Worcester Technical High School Innovation Center IQP Interview

Name: Diana Lados

Position: Professor

Organization: WPI

Field: Mechanical Engineering & Material Science

Interested in using center? ☒ YES / NO

Immediate Projects? ☒ YES / NO

Examples:

Every year new IQP and MQP projects.

Students working on acoustic metal issues.

Required Equipment:

Other Suggestions:

Lectures from WPI Professors to students and business owners, on current research and developments.

Green Engineering, Food Engineering (Water Processing), Nano Technology.

Other Potential Contacts:

Worcester Technical High School Innovation Center IQP Interview

Name: Diran Apelian

Position: Professor & Director of Metal Processing Institute (MPI)

Organization: WPI

Field: Materials Science

Interested in using center? ☒ YES / NO Very Positive

Immediate Projects? YES / ☒ NO

Examples:

Metal Processing Institute (MPI) has many projects all the time.

Required Equipment:

Other Suggestions:

A tour of WTHS and presentations to be given on how the two schools can cooperate.

Other Potential Contacts:



Worcester Technical High School Innovation Center IQP Interview

Name: George Pins

Position: Professor

Organization: WPI

Field: Life Sciences and Bioengineering

Interested in using center immediately? ☒ YES / NO

Immediate Projects? YES / ☒ NO

Examples:

Required Equipment:

Injection Molding, Plastics Forming, custom glass blowing.

Other Suggestions:

A vision of setting up a course or a lab for corporate people and students of WTHS, in order to familiarize them with equipment and techniques.

Other Potential Contacts:

Kevin O'Sullivan, Allen Hoffman.